GCSE MARKING SCHEME

SUMMER 2024

GCSE
MATHEMATICS – NUMERACY
UNIT 2 – HIGHER TIER
3310U60-1

About this marking scheme

The purpose of this marking scheme is to provide teachers, learners, and other interested parties, with an understanding of the assessment criteria used to assess this specific assessment.

This marking scheme reflects the criteria by which this assessment was marked in a live series and was finalised following detailed discussion at an examiners' conference. A team of qualified examiners were trained specifically in the application of this marking scheme. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners. It may not be possible, or appropriate, to capture every variation that a candidate may present in their responses within this marking scheme. However, during the training conference, examiners were guided in using their professional judgement to credit alternative valid responses as instructed by the document, and through reviewing exemplar responses.

Without the benefit of participation in the examiners' conference, teachers, learners and other users, may have different views on certain matters of detail or interpretation. Therefore, it is strongly recommended that this marking scheme is used alongside other guidance, such as published exemplar materials or Guidance for Teaching. This marking scheme is final and will not be changed, unless in the event that a clear error is identified, as it reflects the criteria used to assess candidate responses during the live series.

WJEC GCSE MATHEMATICS - NUMERACY

SUMMER 2024 MARKING SCHEME

Unit 2: Higher Tier	Mark	Comments
1(a)(i) 18 to 24 hours	B1	
1(a)(ii) 97	B1	
1(a)(iii) 13	B1	
1(a)(iv) States or unambiguously implies 'No' with a reason, e.g. 'no people in group 0 to 6 hours'	E1	Allow 'No' with e.g. 'the point before 6 hours is at zero' Do not allow 'Can't tell' with e.g. 'it is grouped data' Do not accept "No' with e.g. 'it is grouped data' (unless explaining why) 'there is no point at 6' '6 hours has a frequency of 0' 'it does not match a group of people' 'the first point is at 0 and the second one is at 20' 'the first plot is at 20' 'the first plot is at 9 hours' 'the first plot above 0 is at 9 hours' 'there is no information at 6 hours, it starts at 9 hours' 'the shortest time is 9 hours'
1(b) Sight of 22.5, 25.5, 29.5 and 31.5 (mm)	B1	Award B1 for sight of 4 × 0.5 in an appropriate calculation Allow 0.4999(….) for 0.5, must clearly be a recurring 9 digit
22.5 + 25.5 + 29.5 + 31.5 or 22+25+29+31 + 4 × 0.5 or equivalent	M1	If B0, FT provided unambiguously chosen: 22 < 'their 22.5' ≤ 23, 25 < 'their 25.5' ≤ 26, 29 < 'their 29.5' ≤ 30, and 31 < 'their 31.5' ≤ 32,
109 (mm)	A1	CAO. Ignore incorrect units given Ignore any working for least possible thickness also given, e.g. 21.5 + 22.5 + 28.5 + 30.5 = 105

Unit 2: Higher Tier	Mark	Comments
2(a) <u>Method **not directly** working with a stated or omitted number of hours difference</u>		Methods may be shown in stages or be embedded <u>Use this method if 2 separate numbers of hours are used, which may not be correct, i.e. ≠12 and ≠10, with or without indication of subtraction</u>
		Penalise every additional **spurious** term by reducing the count of correct terms by 1*
$0.324 \times 8 \times$ **(10 or 12)** $\times 7 \times 80 \div 1000$	M3	<u>Allow '× 32.4' for '× 0.324'</u> M2 for any 4 or 5 correct terms* M1 for any 3 correct terms*
$0.324 \times 8 \times$ **(12 or 10)** $\times 7 \times 80 \div 1000$ **with** the intention to subtract	m1	Must be an indication of the intention to subtract, in either order **FT from 5 (or 6) consistent correct terms** for use of • the other value 10 or 12 respectively • 'their number of hours' are 13 **and** 11 (incorrect) Award m0 if inconsistent, i.e. not an equal number of **consistent correct terms*** between the expressions. Mark 'their better stated calculation' first if both are given
(Saving is 17.418… − 14.515…=) (£) 2.90	A1	CAO All working must be checked, do not award 5 marks for £2.90 from incorrect working.
2(a) *<u>Alternative method:</u>* *<u>Method **directly** working with a stated or omitted number of hours difference</u>*		*Methods may be shown in stages or be embedded* *<u>Use this method if a single number of hours is used, which may not be correct, i.e. ≠2, or if the number of hours is omitted</u>* *Do not allow 2 hours as a correct term from incorrect working, e.g. $13 − 11 = 2$* *Penalise every additional **spurious** term by reducing the count of correct terms by 1**
$0.324 \times 8 \times 2 \times 7 \times 80 \div 1000$	M4	*<u>Allow '× 32.4' for '× 0.324'</u>* *M3 for any 5 correct terms** *M2 for any 4 correct terms** *M1 for any 3 correct terms**
(Saving is) (£) 2.90	A1	*CAO* *All working must be checked, do not award 5 marks for £2.90 from incorrect working.*
Organisation and communication *Organised to include labels, e.g. Number of hours Total number of kWh Cost per day Cost per week*	OC1	For OC1, candidates will be expected to: • present their response in a structured way • explain to the reader what they are doing at each step of their response • lay out their explanations and working in a way that is clear and logical • write a conclusion that draws together their results and explains what their answer means
Writing *Units to include, e.g. kW kWh £*	W1	For W1, candidates will be expected to: • show all their working • make few, if any, errors in spelling, punctuation and grammar • use correct mathematical form in their working • use appropriate terminology, units, etc.

2

Unit 2: Higher Tier	Mark	Comments
2(b) Height = tan68° × 3.3 or height = $\frac{\sin68° \times 3.3}{\sin(90-68)°}$	M2	Or alternative correct full method, isolating height M1 for tan68° = height / 3.3 or $\frac{height}{\sin68°} = \frac{3.3}{\sin(90-68)°}$ or equivalent
8.167… (m) or 8.17 (m) or 8.2 (m)	A1	Allow 8(m), 8.1(m) 8.16(m) from correct working
3(a) Midpoints 1, 4, 7, 11, 16	B1	
1 × 8 + 4 × 12 + 7 × 20 + 11 × 4 + 16 × 6 (= 8 + 48 + 140 + 44 + 96) (= 336)	M1	FT 'their midpoints' provided at least 4 lie within the appropriate group, including bounds throughout Use of lower bounds gives 276 Use of upper bounds gives 396
÷ 50	m1	
6.72 or 6.7 (walks)	A1	Allow rounded to 7 (walks) from appropriate working Use of lower bounds gives 5.5(2 walks) or 6 (walks) Use of upper bounds gives 7.9(2 walks) or 8 (walks)
3(b) 06(:)53 or 6(:)53 a.m.	B1	Allow 06(:)53 a.m. or 6(:)53 Do not accept (0)6(:)53 p.m.

3

Unit 2: Higher Tier	Mark	Comments
3(c) (Height)^2 = 7.6^2 – (18.8 – 12.6)^2 or (Height)^2 = 7.6^2 – 6.2^2 or cos$^{-1}(\frac{18.8-12.6}{7.6})$ = 35(.3345…)° and sin 35(.33…)° = <u>Height</u> or tan 35(.33…)° = <u>Height</u> 7.6 6.2	M2	M1 for sight of 18.8 – 12.6 with • any attempt to use Pythagoras' Theorem (including summing rather than subtraction) • cos$^{-1}(\frac{18.8-12.6}{7.6})$ = 35(.3345…)° and an attempt to use sine or tan

Height^2 = 19.32 or (Height =) √19.32
                  or (Height =) 7.6 × sin 35(.33…)°
                  or (Height =) 6.2 × tan 35(.33…)°
	A1	

(Height =) 4.39(54... m) or 4.4(m)	A1	Do not allow 4.3(m) from premature rounding of 35.3345…° May be implied in further working Provided at least M2 previously awarded, FT from √'their 19.32' provided < 7.6 (m)

(Volume of concrete) ½ × (12.6 + 18.8) × 4.4 × 50
or   ½ ×   31.4   × 4.4 × 50
or
  ½ × (18.8 – 12.6) × 4.4 × 50 +   12.6 × 4.4 × 50
or   ½ ×   6.2   × 4.4 × 50 +   12.6 × 4.4 × 50
	M2	FT 'their derived 4.4' provided
		• 'their derived 4.4' < 7.6
		• 'their derived 4.4' ≠ 6.2
		• 'their derived 4.4' ≠ 'their 18.8 – 12.6'
		
		May be seen in stages, e.g. with '× 50' in further working
		
		M1 for any one of the following:
		(Area of cross-section)
		• ½ × (12.6 + 18.8) × 4.4 (= 69.08 or 69.1m^2)
		• ½ × (18.8 – 12.6) × 4.4 + 12.6 × 4.4
		                                        (= 13.64m^2 + 55.44m^2)
		(Volume cuboid)
		• 12.6 × 4.4 × 50 (= 55.44 × 50 = 2772 m^3)
		(Volume triangular prism)
		• ½ × (18.8 – 12.6) × 4.4 × 50
		                                        (= 13.64 × 50 = 682 m^3)

(Volume of concrete) Answer in the range 3450 (m^3) to 3455 (m^3)	A1	FT from previous M2 only and 'their derived 4.4' from an attempt to use Pythagoras' Theorem or cosine followed by sine On FT from M2, allow a similar range from rounding or truncation If previous M0 A0, award SC1 for an answer of 4867 (m^3) from 'their 4.4' = 6.2

4

Unit 2: Higher Tier	Mark	Comments
4(a)(i) 5×10^8 or 5.0×10^8	B1	

4(a)(ii)
 	
140
     $\times 10^9$
          $\div 300$
               $\div 24$
 	
19 400 000 (kg per hour)
	
	M1
	M1
	M1
	
	A2
		Method marks can be awarded in any order but the operation must be unique (not contradicted or repeated in the working)
		
		'÷ 7200' implies final M1 M1
		
		Award M3 for sight of
		$\dfrac{140 \times 10^9}{300 \times 24}$ or $\dfrac{1.4 \times 10^{11}}{7.2 \times 10^3}$ or equivalent
		
		ISW, accept 19.4 million or 1.94×10^7 or equivalent
		
		A1 for sight of 19 444 444(.44…) or for incorrect rounding or truncation of this answer
		
		FT, for A1, from M1 M0 M1 or M1 M1 M0, including if an incorrect 3rd term is included, for correct evaluation of 'their calculation' **and** expressing 'their final answer' correct to 3 significant figures provided rounding is required, e.g.
		• $140 \times 10^9 \div 300$ leading to 467 000 000
		• $140 \times 10^9 \div 24$ leading to 5 830 000 000
		• $140 \times 10^9 \div 300 \div 12$ leading to *38 900 000*
		($140 \times 10^9 \div 300 \times 24 = 11 200 000 000$,
		$140 \times 10^9 \div 24 \times 300 = 1 750 000 000 000$,
		        no rounding required, hence A0)
		
		FT, for A1, from M0 M1 M1 for an answer of 194 000, 1 940 000, 194 000 000, or 1 940 000 000, provided it is from a correct evaluation of 'their calculation'
		
		If no marks, award SC1 for equivalent operations used without 140, i.e.
		$\dfrac{10^9}{300 \times 24}$ or $10^9 \div 300 \div 24$ or equivalent

4(b)(i) (Venus orbit) $2 \times \pi \times 1.08 \times 10^8$
     or   678 000 000 to 680 000 000
     or 6.78×10^8 to 6.8×10^8
(To find distance travelled in one day) $\div 224.7$
 	
 (Distance in one day) $3.(0....) \times 10^6$
	M1
	
	M1
	
	A2
		
		FT 'their derived orbit' provided π is involved in 'their calculation of Venus orbit'
		
		CAO
		
		A1 for any one of the following answers:
		• (not in standard form) 3 000 000 (km)
		• (incorrect standard form) e.g. 30×10^5
		• (in the range) 3 017 000 (km) to 3 026 300 (km)
		• (in terms of π) e.g. 961 281.7089π (km)
		
		• ($\pi \times 1.08 \times 10^8 \div 224.7 =$) $1.5(…) \times 10^6$
		
		If no marks, award SC1 for an answer of
		     $4.8(0…) \times 10^5$ (from $1.08 \times 10^8 \div 224.7$)
		or $9.6(1…) \times 10^5$ (from $2 \times 1.08 \times 10^8 \div 224.7$)

Unit 2: Higher Tier	Mark	Comments
4(b)(ii) 368 187 456 (km²)	B3	ISW Allow appropriate rounding from correct working, such as 368 187 500 or 368 000 000 or 370 000 000 B2 for any one of the following: • 8 × 460 234 320 ÷ 10 • 7 × 460 234 320 ÷ 10 + 460 234 320 ÷ 10 • 460 234 320 − 2 × 460 234 320 ÷ 10 • (2 × 460 234 320 ÷ 10 =) 92 046 864 • (7 × 460 234 320 ÷ 10 =) 322 164 024 B1 for any one of the following, including embedded in other working: • 460 234 320 ÷ 10 • (460 234 320 ÷ 10 =) 46 023 432 *If errors in calculating 1 + 7 or 1 + 2 + 7 are **seen**, then award B2 or B1 as appropriate e.g.* • *1 + 7 = 9, 9 × 460 234 320 ÷ 10 B2* • *9 × 460 234 320 ÷ 10 B1* *(embedded 460 234 320 ÷ 10)*

6

Unit 2: Higher Tier	Mark	Comments
5(a) (Number of gallons used =) $\dfrac{36}{48} + \dfrac{65 \times 1\frac{24}{60}}{35}$ OR $\dfrac{36}{48} + \dfrac{65 \times 1.4}{35}$ (= 0.75) (= 2.6)	M3	Allow M2 for $\dfrac{36}{48} + \dfrac{65 \times 1.24}{35}$ (= 0.75 + 2.30…) OR sight of $\dfrac{65 \times 1.4}{35}$ or equivalent M1 for sight of $\dfrac{36}{48}$ or sight of 0.75 provided not from incorrect work Allow M1 for sight of $\dfrac{65 \times 1.24}{35}$ OR $\dfrac{65 \times 84}{35}$ (=156)
= 3.35 (gallons)	A1	CAO Allow 3.4 (gallons) provided no incorrect work seen
5(b) 3.35 $\times 8 \div 1.75 \times 1.49$		FT 'their 3.35 (gallons)' from (a) Allow use of the conversion 1 litre = 1.75 to 1.76 pints
	M2	M1 for the correct use of 3.35 with any 2 terms OR M1 for 8 ÷ 1.75 × 1.49 OR if one of the direct conversions from gallons to litres used as listed below, M1 for any one of the following: • 3.35 × (4.544 to 4.572) • 1.49 × (4.544 to 4.572) • 3.35 × 1.49 × 'their 4.544 to 4.572' but using a value <u>just</u> outside this range e.g. 4.6 • 3.35 ÷ (0.2187 to 0.22) • 1.49 ÷ (0.2187 to 0.22) • 3.35 × 1.49 ÷ 'their 0.2187 to 0.22' but using a value <u>just</u> outside this range e.g. 0.218
= (£)22.81(828...) or (£)22.82	A1	Must be from M2 Strict FT of their correct conversion between gallons and litres. Answers will be in the range (£)22.68 to (£)22.82 Allow the conversion into litres from any of the following also <u>1 pint = 568 to 572 ml</u> <u>1 gallon = 4.544 to 4.572 litres</u> 3.35 × 8 × (0.568 to 0.572) 3.35 × (4.544 to 4.572) <u>1 litre = 0.2187 to 0.22 gallons</u> 3.35 ÷ (0.2187 to 0.22)

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Unit 2: Higher Tier	Mark	Comments
6(a)		Accept use of values of **π** from 3.14 to 3.142 Note: Accept $(54^2 – 50^2)$ written as $(54 + 50) \times (54 – 50)$

$\dfrac{360 – 38}{360} \times \pi \times (54^2 – 50^2)$ (× 2)   or equivalent
 	
(= 1168.35 to 1169.11 or 16744**π**/45)
	M2	M1 for one of the following:
		• $\dfrac{360 – 38}{360} \times \pi \times 54^2$ (× 2) (= 8189.7 to 8195)
		   (=13041**π**/5)
		
		• $\dfrac{360 – 38}{360} \times \pi \times 50^2$ (× 2) (= 7021.3 to 7026)
		   (= 20125**π**/9)
		
		• $\dfrac{38}{360} \times \pi \times (54^2 – 50^2)$ (× 2) (= 137.8 to 138)
		   (= 1976**π**/45)

= 2336.7 to 2338.21 or 33488**π**/45 (mm³)	A1	CAO If no marks yet awarded, SC1 for any one of the following • $\dfrac{360 – 38}{360} \times \pi \times (27^2 – 25^2)$ (× 2) (= 292 to 292.3) (= 4186**π**/45) • $\pi \times (54^2 – 50^2) \times 2$ (= 2612 to 2614.15 or 832**π**)
(Number of C-clips =) $\dfrac{1\,500\,000}{2336.7 \text{ to } 2338.21}$	M1	FT 'their 2336.7 to 2338.21' provided at least 1 mark previously awarded
= 641 (C-clips)	A1	Only FT from M2M1 or M1M1 previously awarded On FT, should be an integer obtained from the truncation of their answer

6(a) Alternative method for the first 3 marks:
 	
$\dfrac{360 – 38}{360} \times \dfrac{(2\times\pi\times54 + 2\times\pi\times50)}{2} \times (54 – 50)$ *(× 2)*
	M2	*Accept use of values of **π** from 3.14 to 3.142*
		
		M1 for one of the following:
		• $\dfrac{360 – 38}{360} \times \dfrac{(2\times\pi\times54 + 2\times\pi\times50)}{360} \times (54 – 50) \times 2$
		   *(= 4673.4 to 4676.42 or 66976**π**/45)*
		
		• $\dfrac{360 – 38}{360} \times \dfrac{(\pi\times54 + \pi\times50)}{2} \times (54 – 50)$
		   *(= 584.1 to 584.6 or 8372**π**/45)*
		
		• $\dfrac{38}{360} \times \dfrac{(2\times\pi\times54 + 2\times\pi\times50)}{2} \times (54 – 50)$ *(× 2)*
		   *(= 137.8 to 138 or 1976**π**/45)*

= 2336.7 to 2338.21 (mm³)	A1	*CAO*
		
		If no marks yet awarded,
		SC1 for any one of the following:
		• $\dfrac{360 – 38}{360} \times \dfrac{(2\times\pi\times27 + 2\times\pi\times25)}{2} \times (27 – 25)$
		   *(= 292 to 292.3 or 4186**π**/45)*
		
		• $\dfrac{(2\times\pi\times54 + 2\times\pi\times50)}{2} \times (54 – 50) \times 2$
		   *(= 2612 to 2614.15 or 832**π**)*

Unit 2: Higher Tier	Mark	Comments

6(b)
 	
$\dfrac{1500 \times \underline{(\text{number of a type of fastener made})}}{149\,000}$
 	
(List of unrounded answers)
231.5(436…), 110.7(382…), 704.6(979…),
453(.0201…)
 	
(Number in sample =)
231, 111, 705, 453
	M1
	
	A1
	
	A1
		Sight of this calculation for any type of fastener
		Allow e.g. (C-clips) $\dfrac{15.4(…) \times 1500}{100}$
		
		OR
		A1 for 232, 111, 705, 453
		Implies the award of M1
		
		Award M1A1A1 for 231, 111, 705, 453 <u>provided no incorrect work seen</u>
		
		If M1A0 awarded,
		A1 on FT from their unrounded answers for equivalent difficulty i.e. provided:
		• their correctly rounded answers sum to 1499 or 1501
		   AND
		• the correct numbers in the sample are given from their unrounded answers, including any decisions regarding rounding up or down
		   AND
		• the numbers in the sample add to 1500

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Unit 2: Higher Tier	Mark	Comments
7(a) (x =) $\dfrac{5.4 \times \sin131°}{\sin32°}$ = 7.69(06…) or 7.7 (km)	M2 A1	M1 for $\dfrac{x}{\sin131°} = \dfrac{5.4}{\sin32°}$ or equivalent OR M1 for $\dfrac{7.7}{\sin131°} = \dfrac{5.4}{\sin32°}$ or equivalent From M1, if 7.69(06…) seen award M2A1 From M1, if only 7.7 seen award M1A0
7(b) (Bottom angle =) $\cos^{-1}\left(\dfrac{6.3^2 + 2.1^2 - 7.7^2}{2 \times 6.3 \times 2.1}\right)$ = 125(.03…) (º) (Bearing =) 125(.03…) – (180 – 120) = 065 (º)	 M2 A1 M1 A1	Allow use of 7.69(06…) for 7.7 Note: Use of sine rule with the angle on the left of the triangle of 13º can lead to a bearing of 064º, <u>if seen please escalate</u> = $\cos^{-1}(-31/54)$ or equivalent M1 for • $7.7^2 = 6.3^2 + 2.1^2 - 2 \times 6.3 \times 2.1 \times \cos(\text{bottom angle})$ OR • $\cos\text{ bottom angle} = \left(\dfrac{6.3^2 + 2.1^2 - 7.7^2}{2 \times 6.3 \times 2.1}\right)$ 124.6(5…) (º) if 7.69(06…) used Use of sine rule can lead to an answer of 124.4(29…) FT 'their 125(.03…)' provided a clear attempt seen to use the cosine rule to calculate the angle at the bottom of the triangle Allow an answer of 065.0(3…) (º) An answer of 65 (º) implies M1A0
7(b) <u>Alternative method:</u> *(Right side angle =) $\cos^{-1}\left(\dfrac{7.7^2 + 2.1^2 - 6.3^2}{2 \times 7.7 \times 2.1}\right)$* *= 42(.06…) (º)* *(Bearing =)* *180 – (180 – (90 + 180 – 131 – 32) + 42(.06…))* *or 180 – (180 – (90 + 17) + 42(.06…))* *or 180 – (73 + 42(.06…))* *= 065 (º)*	 *M2* *A1* *M1* *A1*	*Allow use of 7.69(06…) for 7.7* *Note: Use of sine rule with the angle on the left of the triangle of 13º can lead to a bearing of 064º, <u>if seen please escalate</u>* *= $\cos^{-1}(49/66)$ or equivalent* *M1 for* • *$6.3^2 = 7.7^2 + 2.1^2 - 2 \times 7.7 \times 2.1 \times \cos(\text{right side angle})$* *OR* • *$\cos(\text{right side angle}) = \left(\dfrac{7.7^2 + 2.1^2 - 6.3^2}{2 \times 7.7 \times 2.1}\right)$* *42.3(…) (º) if 7.69(06…) used* *FT 'their 42(.06…)' provided a clear attempt seen to use the cosine rule to calculate the angle on the right side of the triangle* *Allow an answer of 065.0(3…) (º)* *An answer of 65 (º) implies M1A0*

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Unit 2: Higher Tier	Mark	Comments
7(c) (Area factor =) $1 - 0.19$ OR $\dfrac{1}{1 - 0.19}$ (= 0.81) (= 1.2345…)	B1	Or percentage, fraction or ratio equivalent to 0.81 or 1.2345… May be implied in further possibly incorrect working e.g. *33×0.81, 33×(1 – 0.19), 33 – 33×0.19 (=26.73)*
(Scale factor =) $\sqrt{1 - 0.19}$ OR $\sqrt{\dfrac{1}{1 - 0.19}}$ (= 0.9) (= 1.1(1…)) (Length of Tanvi's map =)	B1	Accept a scale factor of 10:9 or 9:10 or equivalents
$\sqrt{1 - 0.19} \times 33$ OR $33 \div \sqrt{\dfrac{1}{1 - 0.19}}$	M1	
= 29.7 (cm)	A1	CAO Accept an answer of 30 (cm) from correct working If no marks awarded, SC1 for any one of the following: • $33 \times \sqrt{0.19}$ (= 14.3(843…cm) • $33 \div \sqrt{1.19}$ (= 30.2(510…cm)
7(d) Tangent drawn at time 20 minutes	M1	An appropriate tangent resulting in a gradient between 0.04 and 0.1
Idea of increase in y ÷ increase in x	m1	Differences need to be attempted for both Allow m1A0 if one difference has been incorrectly calculated An attempt may have been made to convert into miles and/or hours
Correctly evaluated gradient for their tangent (between 0.04 and 0.1)	A1	Dependent on M1m1 awarded Allow their correctly evaluated gradient to be a fraction that may include a decimal e.g. 1.3/20 May be embedded within further work Mark final answer
$\dfrac{\text{'their gradient'} \times 60}{1.6}$ or $\dfrac{\text{'their gradient'} \times 5 \times 60}{8}$ or equivalent	M1	FT 'their gradient' provided it's an increase in y ÷ increase in x from an attempt made at drawing a tangent at time 20 minutes Do not award if previous incorrect attempt/s made at converting one or both differences into miles and/or hours
Correctly evaluated speed in mph for 'their gradient' (between 1.5 and 3.75 mph)	A1	Accept appropriate rounding

Unit 2: Higher Tier	Mark	Comments
8(a) 5000×1.006^{18}	M1	
$= (£) \ 5568.44(1446)$	A1	If no marks awarded, SC1 for $(5000 \times 1.006^{17} =) \ (£)5535.23(0\ldots)$ or $(£)5535.23$
8(b) $\quad (1+x)^2 - 1 = 0.04 \qquad$ or equivalent	M1	Allow a place value error in the 0.04 for at most M1m1A0A0 Accept any letter used for x
$1 + x = \sqrt{1.04} \qquad$ or equivalent	m1	
$x = 0.01(980\ldots)$	A1	
(Interest rate every 6 months =) 1.98 (%)	A1	CAO
8(b) _Alternative method:_ _i is the nominal annual rate_ $\left(1 + \frac{i}{2}\right)^2 - 1 = 0.04 \qquad$ _or equivalent_	M1	_Allow a place value error in the 0.04 for at most M1m1A0A0_ _Accept any letter used for i_
$1 + \frac{i}{2} = \sqrt{1.04} \quad$ _or equivalent_	m1	
i = 0.03(960\ldots) or 3.96(0\ldots)%	A1	_May be implied in further working_ _If their final answer comes from $\sqrt{1.04} - 1$ AND 0.03(960\ldots) or 3.96(\ldots)% not seen, then award this A1 for 0.01(980...) or 1.98(03\ldots)(%) rounded or truncated_
(Interest rate every 6 months =) 1.98 (%)	A1	_CAO_